Miller, Anna

From: Miller, Anna
Sent: Monday, June 13, 2016 11:52 AM
To: 'Duncan Hamilton'
Subject: Lanphar #1-12

Duncan:
I have a request for information from you about the confining zone for the Lanphar #1-12. Pursuant to the Code of Federal regulations Part 146.22, the injection must be separated from the lowermost underground source of drinking water by a confining zone that is free from known open faults and fractures within the area of review. While EPA gathered some larger scale information on faults and fractures, the geologic information in the application and in supplemental information for the confining zone directly above the injection zone did not specifically address this topic. The confining zone named in your application is the Salina Group Formations: A-2 Carbonate, A-2 Evaporate, and Ruff. Please supply information on the presence or absence of open faults or fractures in these formations within the area of review. Some examples for demonstrating that the confining zone is free from known faults or fractures are: existing geophysical logs of wells in the area of review, other logs, statement by staff geologist based on local information, etc. Please call me if you have any questions.
Anna

Anna Miller | *Environmental Scientist* | *UIC Branch* | *EPA Region 5* | *312-886-7060*

Miller, Anna

From: Duncan Hamilton <hamiltongeologicalservices@gmail.com>
Sent: Tuesday, June 14, 2016 8:59 AM
To: Miller, Anna
Subject: Re: Lanphar #1-12

Hi Anna:

Good to hear from you. No problem I will address your request as soon as possible.

Regards

Duncan

On Mon, Jun 13, 2016 at 12:52 PM, Miller, Anna <miller.anna@epa.gov> wrote:

Duncan:
I have a request for information from you about the confining zone for the Lanphar #1-12. Pursuant to the Code of Federal regulations Part 146.22, the injection must be separated from the lowermost underground source of drinking water by a confining zone that is free from known open faults and fractures within the area of review. While EPA gathered some larger scale information on faults and fractures, the geologic information in the application and in supplemental information for the confining zone directly above the injection zone did not specifically address this topic. The confining zone named in your application is the Salina Group Formations: A-2 Carbonate, A-2 Evaporate, and Ruff. Please supply information on the presence or absence of open faults or fractures in these formations within the area of review. Some examples for demonstrating that the confining zone is free from known faults or fractures are: existing geophysical logs of wells in the area of review, other logs, statement by staff geologist based on local information, etc. Please call me if you have any questions.
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Underground Injection Control Branch
U.S. EPA Region 5 (WU-16J)
77 W. Jackson
Chicago, IL 60604

June 30, 2016

Attention: Anna Miller
Environmental Scientist

Dear Anna:

In response to your note dated Monday, June 13, 2016, requesting additional information on the confining zone for the Lanphar 1-12 injection well application and in particular the potential presence of open faults or fractures in the confining zone, I conducted the following review:

Detailed information is available for the five key wells directly offsetting and including the Lanphar 1-12:

Offsetting Wells Located in Section 12, Twp. 5N, Range 11E, Addison Twp., Oakland County:
Lanphar 2-12
Lanphar 3-12
Lanphar 7-12
Morris 4-12
Goodfellow 5-12

The information includes:

1. A complete suite of geophysical logs and in particular Dual Laterlogs (resistivity).
2. Detailed sample descriptions.
3. A gas chromatograph log through the Salina Group section which includes sample descriptions, formation tops, drilling rate and notation of potential fluid loss while drilling.

The confining zone for Lanphar 1-12 includes the entire Silurian Salina Group that overlies the injection zone and separates it from the lowermost underground source of drinking water. The Salina Group in this region is most notably comprised of the C shale, B-Salt and the A-2 carbonate and evaporate sequence. This interval represents approximately over 600 feet of relatively impermeable shale, salt, anhydrite and dense limestone. The B-salt although impermeable is highly susceptible to solutioning along fault structures or fracture zones.

Detailed analysis of the data available indicated the following conclusions with respect to the potential presence of faults or fractures in the Salina Group within the area of the Lanphar 1-12 well:

1. Mapping of the B-salt thickness, revealed no anomalous isopach changes within the five offsetting wells which suggests there was no salt-solutioning along a fault or fracture zone. The B salt does vary in thickness related to the presence of the underlying reef structure.

2. Review and analysis of the geophysical logs indicate no formation thickness anomalies or anomalous resisitivity deflections (spikes) that would indicate the presence of faulting or fractures.

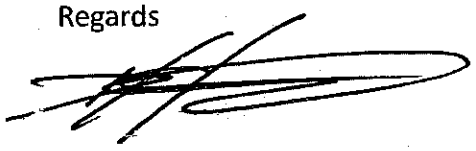
3. The gas chromatograph log and sample descriptions do not document any significant fluid loss or drilling rate anomalies that would suggest that the respective boreholes intersected a fault or fracture within the confining Salina Group.

As a less direct form of evidence of the competency of the Salina Group as a confining zone in the region is the presence of an approved Niagaran natural gas storage reef approximately 1.5 miles to the southwest of Lanphar 1-12; known as the Leonard storage reef.

In summary the above reviewed data does not indicate the potential for any fault or fracture development in the Salina Group which comprises the confining zone for the Lanphar 1-12 well.

If you require any additional information please do not hesitate in contacting me.

Regards



Duncan Hamilton, M.Sc., P.Geo.
Energex Petroleum (USA) LLC.